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Editor - Captain L. B. Marshall, MC, USN

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Circular Letters:

Effect of Sugars on Erythrocytes Preserved at 0° to -3° C: This preliminary report deals with the effect of certain sugars on the osmotic fragility of erythrocytes maintained at temperatures between 0° C. and -3° C. and the result of transfusions of blood thus preserved in humans. The report appears desirable in view of the fact that the in vitro and in vivo studies thus far carried out strongly suggest that, with proper technic, red cells can be preserved without hemolysis for periods of time much longer than now obtained with any of the acid-citrate-dextrose solutions and that such cells remain in circulation, when transfused, at least as long as the red cells of whole blood collected in acid-citrate-dextrose solutions and stored for less than 21 days.

The fragility studies were carried out for the purpose of general screening; erythrocytes showing diminished resistance to hypotonic salt solution invariably showed poor survival when transfused. The in vivo studies included post-transfusion variations in the blood volume, erythrocyte count, hematocrit, bilirubin level, urobilinogen output and studies of survival by the non-agglutinable cell count. In some instances it has been necessary to choose, for the time being, an arbitrary value for some of the experimental conditions (such as pH, volume of resuspension fluid, etc.) on the basis of work previously done. The complex inter-relationship of the various elements may require readjustment of many of the values here reported. Therefore, none of the data obtained so far can be considered as final.

Material and Technic. Erythrocytes were used as whole acid-citrate-dextrose (A.C.D.) blood, as acid citrated packed erythrocytes, and as acid citrated packed cells resuspended in a 4 percent globin solution. The packed cells were obtained by bleeding in a cooled sodium citrate solution prepared as follows: Trisodium citrate dihydrate,2.1 Gm.; citric acid monohydrate, 0.66 Gm.; water to 100 ml. Seventy-five ml of this solution were used for each 500 ml of blood. Within 12 hours of collection, after storage at 1° C., the blood was centrifuged and from 80 to 85 percent of the plasma removed. To the red cell residue, solutions of the various sugars with or without globin were added. All the concentrations noted are weight to volume of the suspension medium. The pH of the fresh A.C.D. blood, in all instances, was between 7 and 7.2. The cells were maintained in rubber stoppered test tubes or cylindrical bottles in aliquots of 10 to 60 ml at -3° C. (±0.2° C.) in the liquid state or at higher temperatures up to +4° C. When the blood was intended for transfusion into humans, it was collected and preserved in the standard 500 ml bottles. Maltose, sucrose and lactose were tested in concentrations of 1 to 12 percent. In all instances the solutions of sugars were sterilized by Seitz filtration.

Experiments in vivo. In all, 64 transfusions of about 500 ml of blood have been given to humans, using blood preserved with the aid of sugars. In 36 instances, lactose was used and in 28 sucrose. The concentration of sugars has been between 3 percent and 5 percent. To all but 3 specimens dextrose was added in concentration of 250 mg./100 ml. Thirty-four of these transfusions

were made with whole blood, 30 with erythrocytes resuspended in 4 percent globin containing sucrose or lactose. The period of preservation varied from 14 to 47 days and the temperature of storage varied from -3° C. to +4° C. In all instances the blood was maintained in the liquid state except for one specimen which was maintained in the solid state at -3° C. In this series there were 2 reactions, one due to pyrogens and one to Rh incompatibility in a known Rh negative patient receiving repeated injections of Rh positive blood. Neither reaction can be attributed to the specific method of blood preservation used. In the majority of cases the changes in the hematocrit and hemoglobin concentrations, the variations in the serum bilirubin content and urobilinogen output were those expected from the transfusion of ACD blood preserved up to 21 days. Blood volume studies were carried out in a number of occasions and in 5 patients, survival studies by the non-agglutinable cell count were carried out using the technic suggested by Young, Platzer and Rafferty. One patient suffering from a hypoplastic anemia received two 500 ml lots of blood preserved with 5 percent sucrose at -3° C. for 14 and 21 days respectively, and two 500 ml of lots of blood preserved with 5 percent sucrose at 0° C. for periods of 31 and 40 days. Evidence from studies of the blood volume, hematocrit, hemoglobin concentration, serum bilirubin and non-agglutinable cell count showed good preservation of the transfused cells.

One patient recovering from coronary thrombosis received 500 ml of blood preserved at -3° C. with 5 percent sucrose for 25 days. The same studies as carried out in the preceding case indicated good retention of the transfused cells. These findings are contrary to those reported by Mollison and Young. The lower temperature of preservation and the addition of glucose is possibly responsible for this difference. From the in vivo studies, packed erythrocytes resuspended in 4 percent globin with 5 percent lactose and stored at 0° to -3° C., gave the most encouraging results. For this reason, blood stored in this manner was used in detailed experiments using 3 healthy recipients. These 3 recipients were normal, young male volunteers who were bled approximately 500 ml and then transfused an amount of stored blood containing the same quantity of red cells removed. The period of preservation of the blood used was 30, 32 and 39 days respectively. In all instances 80 to 85 percent of the plasma was replaced by 4 percent globin solution containing 5 percent lactose and 250 mg./100 ml of dextrose. Preservation was carried out at 0° C. (±0.2° C.).

In these studies, experimental conditions were not always necessarily optimal for red cell preservation, and therefore the limits of storage are not maximal and will most likely be extended in future work. No attempt has been made to study the mechanism of action of the sugars on the preservation of red cells. (Proc. Soc. Exper. Biol. & Med., December '50, M. M. Strumia et al.)

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Determination of Dextran in Blood and Urine: It has been demonstrated that glucose standard may be used in the determination of dextran and the results expressed as glucose equivalents. The use of a glucose standard obviates the preparation of a dextran standard. The simplicity and specificity of this method provides advantages over previously described methods.

Method. One ml of plasma or urine is placed in a 40 ml centrifuge tube to which 3 ml of 30 percent potassium hydroxide has been added. Digestion is carried out for 1 hour in a boiling water bath. After boiling, the contents of the tube are diluted with 8 ml of water, and 10 ml of 95 percent ethanol are added to precipitate the polysaccharide. The centrifuge tube is allowed to stand in the refrigerator for at least 3 hours so that precipitation is complete. The precipitate is then removed by centrifugation for 25 minutes at 2500 R.P.M. The supernatant fluid is decanted. When whole blood is used, it is necessary to reprecipitate the polysaccharide. Dissolve the precipitate in about 5 ml of water and transfer quantitatively to a volumetric flask. The dilution of the polysaccharide is such that 1 ml of solution contains between 10 and 100 micrograms. All determinations are carried out in duplicate. The determinations of carbohydrate concentrations are carried out as outlined by Durham et al. below. The absorption spectra of the colored reaction products of the anthrone reagent and 100 micrograms of glucose and 100 micrograms of dextran are compared in a Beckman spectrophotometer.

Rapid Measurement of Carbohydrate in Blood. Anthrone reagent is prepared, 0.2 percent in 95 percent H_2SO_4 (analytical reagent grade only). Two volumes of this reagent are added from a burette to 1 volume of the unknown polysaccharide solution. After mixing, the mixture is allowed to stand for 15 minutes.

A blank containing distilled water instead of the polysaccharide sample is prepared and comparisons are made colorimetrically, as indicated above, by the use of a glucose standard. A standard containing 100 gammas of glucose in 5 ml of water, plus 2 volumes of anthrone reagent is suggested as suitable, although other concentrations may be required to suit the requirements of a particular analysis.

Concentrations of dextran in blood or urine are expressed in terms of glucose equivalents.

The proper precautions should at all times be taken in the handling of the anthrone reagent, because of the concentrated sulfuric acid used. (W.L. Bloom and M. L. Wilcox, Emory University, Atlanta, Georgia)

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Deaths from Dicumarol: Reports of deaths due to hemorrhagic diatheses resulting from the use of bishydroxycoumarin U.S.P. (dicumarol) have been accumulating in the literature. Since the drug became available in 1941, overly enthusiastic reports leading to its general use prophylactically and therapeutically, coupled with the lack of adequate laboratory tests for its control, have resulted in an increased number of reported and unreported fatalities.

De Takats feels that the so-called protective levels (20 to 30 percent of normal prothrombin activity) cannot and should not be maintained in the ambulatory patient. He finds that the usual level of 50 percent for an ambulatory patient is nonprotective, and he concludes that at present there is not a safe anticoagulant. In 1943 DeBakey cautioned against the promiscuous use of this drug and suggested that much safer procedures might produce the same result without subjecting the patient to the hazards of this particular drug.

In a series of over 900 cases at Massachusetts General Hospital in which dicumarol was used prophylactically, there were no fatal pulmonary emboli but there were 2 deaths from hemorrhage. In a comparable series of cases in which dicumarol was not used prophylactically there was 1 fatal pulmonary embolism.

The statistics available on pulmonary emboli were compiled before it became common practice to encourage early ambulation, early movement in bed, proper bed posture and better postoperative care, with respect to fluids, electrolyte, and nitrogen balance. Evans and Boller, after a study of their series of 45,000 surgical cases at the Lahey Clinic, concluded that there was a one-third reduction in postoperative thromboembolic complications on the last-mentioned regimen.

A review of the literature reveals that the majority of the fatalities are caused by gross overdosage. In addition, poor results have occurred because of the lack of uniformity in prothrombin determinations. There is a burning need for a more standardized laboratory test--one that is simpler and more accurate. It is difficult to obtain a safe prothrombin level; moreover, a low prothrombin level does not necessarily prevent thrombus formation. Patients have been observed with low prothrombin values in whom thrombosis developed. Dicumarol only inhibits prothrombin formation in the liver; prothrombin determination alone does not give any indication of the thrombosing tendency. Ochsner and his co-workers have conducted investigations that suggest that intravascular clotting is determined by the relative disproportion between the prothrombin and the antithrombin levels of the blood; whenever the disproportion becomes great enough, intravascular clotting can occur. This may explain why thromboses develop in some patients with low prothrombin levels as a result of anticoagulant therapy.

Failure to recognize the limitations of tests for prothrombin time may obstruct effective therapy. Under the false impression that the patient is being protected from thromboembolic complications by the use of dicumarol, one may withhold venous ligation until it is too late. It is the experience of most clinicians that persons with phlebothrombosis who are under anticoagulant therapy can have repeated pulmonary infarction and even fatal pulmonary embolism despite the fact that further coagulation is prevented by the anticoagulant. In the authors' experience, vein interruption is a more certain and a much safer method of controlling phlebothrombosis and thrombophlebitis.

Reports of 32 deaths ascribed to dicumarol have been found in a review of the literature. The largest series of deaths, 7 in all, has occurred in patients with subacute bacterial endocarditis, and in these cases cerebral hemorrhage was the usual terminal episode. Four fatalities were reported in cases in which sympathetic blocks were combined with anticoagulant therapy. A death from retroperitoneal hemorrhage followed lumbar sympathetic block during treatment with dicumarol. Hemorrhagic diatheses caused death in 4 patients with malignant growths in whom venous thromboses developed preoperatively or postoperatively. Four deaths have followed hemorrhage from operative sites. Other fatalities have occurred during the treatment of venous accidents and cardiovascular diseases.

Four cases of fatal hemorrhagic sequelae following administration of dicumarol are presented by the authors. An analysis of the cases reveals that the prothrombin level was maintained between 33 and 40 percent in 3 cases and between 25 and 33 percent in the 4th case. The findings are in sharp contrast to the results at the Mayo Clinic, where it was reported that "if the prothrombin level is maintained at more than 10 percent of normal, the risk of bleeding is nominal." De Takats noted in his series that when the prothrombin level reached 20 percent, the 8 percent incidence of hemorrhage was too great. In Bruzelius' report there was a failure to correlate hemorrhage and low concentrations of prothrombin in 28 percent of the patients. The 4 cases reported in this article are theoretically in the "safe range" of prothrombin level. However, there is a definite lack of correlation between the prothrombin level and the hemorrhagic diatheses. It is reiterated that the prothrombin time does not give the complete picture of venous thrombosis. (A.M.A. Arch. Surg., January '51, L. T. Wright and M. Rothman)

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Urethane Toxicity: Wide experience in the use of urethane (ethyl carbamate) has accumulated since the appearance of the original report of Paterson et al. in 1946. It is now generally accepted that the drug has proved of some use in chronic myelogenous leukemia and less constantly in chronic lymphatic leukemia. Results in acute and subacute leukemia and polycythemia vera have been disappointing.

With notable exceptions other malignant diseases have responded poorly or not at all. Hodgkin's disease, lymphosarcoma, mixed salivary-gland tumor, lymphoepithelioma and various carcinomas have occasionally regressed, as have mycosis fungoides and endocrine-independent prostatic carcinoma. In multiple myeloma reports have indicated striking symptomatic improvement in about 30 percent of cases, with reversal of serum proteins and bone-marrow abnormalities in some.

Daily doses have varied from 1 to 13 Gm. for period of 9 days to 10-1/2 months. Until recently the largest published total amount was 683 Gm. in 299 days. The schedule most commonly employed in the treatment of leukemia has been 2 to 4 Gm. daily in divided doses for 1 to 3 months, often followed by a maintenance dose of 1 or 2 Gm. Harrington and Moloney, however, have recently reported the use of larger quantities for period up to 30 months.

Eight deaths attributed to urethane have been found in the literature by the authors, who report an additional death caused by fatal liver derangement. The causes of the other 8 deaths were: agranulocytosis, 1 case; aplastic anemia, 2 cases; hepatic necrosis, 1 case; and pneumonia without normal leukocytic response to infection, 4 cases.

In addition, serious toxic non-fatal effects have been reported, among which are gastrointestinal symptoms, neutropenia, aplastic anemia, renal toxicity, liver toxicity, mental symptoms, headache and rapid weight loss. The toxic effects have followed various doses and total amounts of the drug.

Gastrointestinal Symptoms. Severe gastrointestinal symptoms have appeared after relatively small amounts of the drug. Serious vomiting, however, has occurred after several months of therapy. Creskoff found that nausea and vomiting was often prevented by intravenous administration of the drug. Berman and Axelrod considered the gastrointestinal symptoms to be local irritative phenomena not requiring cessation of therapy. Enteric-coated urethane tablets have appeared to be helpful.

Neutropenia. Neutrophil counts of less than 4,000 have been reported after as little as 3 Gm. a day for 18 days and as much as 295 Gm. in 7-1/2 months. The bone marrow of individual patients has shown marked variation in susceptibility to urethane. In fact, Paterson found that from 19 to 134 Gm. given in 11 to 36 days at various dosage levels was required to produce a fall of 20,000 leukocytes in chronic myeloid leukemia. Patients without leukemia apparently have shown greater susceptibility to the drug.

Aplastic Anemia. In fatal cases of aplastic anemia 1 patient received 13 Gm. daily for 24 days, and another 5 Gm. for 25 days. A number of non-fatal cases have been recorded.

Renal Toxicity. In a case reported by Kennedy, Nathanson and Aub, red and white cells and albumin appeared in the urine after 3 or 4 Gm. daily for 17 days. The abnormal urinary findings disappeared 2 weeks after cessation of treatment. The urine remained clear when urethane therapy was reinstituted. This is of interest since renal glomerular lesions have been produced with urethane in mice.

Liver Toxicity. The only previously reported case of hepatic necrosis was one of prostatic carcinoma reported by Huggins, Yu and Jones. The patient received an average of 9 Gm. for 33 days and 14 to 16 Gm. daily for the last 15 days for a total of 297 Gm. Harrington and Moloney reported a patient with Multiple myeloma who showed icterus after urethane therapy consisting of 6 Gm. a day for 4-1/2 months. The jaundice subsided in 11 weeks and was attributed to infectious hepatitis from blood transfusion.

In the authors' case of fatal hepatic necrosis in a patient receiving large doses of urethane in the treatment of multiple myeloma, duration of therapy was 21 months, with daily dose of 6 Gm. for 4 months preceding death--a total of 2,259 Gm. This is the second reported case of fatal liver derangement in a patient receiving urethane. (New England J. Med., 21 December '50, R. L. Ohler et al.)

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Sodium Sulfacetimide for the Prophylaxis of Gonorrheal Ophthalmia Neonatorum: With the introduction of silver nitrate prophylaxis there has been a remarkable reduction in the incidence of gonorrheal ophthalmia neonatorum and its complications. However, there are several disadvantages to the classical Credé method: (1) incomplete protection from gonorrheal ophthalmia neonatorum; (2) chemical conjunctivitis, a frequent complication; and (3) occasional cases of blindness which have occurred when a stronger solution of silver nitrate was used by mistake (this, however, has been almost completely eliminated by the use of a 1 percent solution in wax ampules).

Substitutes for silver nitrate have been proposed, therefore: silver acetate; sulfathiazole by mouth (total dose of 20 gr. given over 3 days, starting 12 hours after birth); and penicillin. In 1947 Franklin stated that penicillin compared favorably with silver nitrate as a prophylactic agent and that penicillin is to be preferred because danger of permanent eye injury is eliminated, instillation is nonpainful, and other ocular complications are less frequent during the first days of life. Penicillin is a therapeutic agent as well as a prophylactic agent.

A study with sodium sulfacetimide for the prophylaxis of gonorrheal ophthalmia neonatorum was made on all of 1,907 infants born at the Louisville General Hospital in a 1-year period in an attempt to find still another satisfactory substitute for silver nitrate. The infants were divided into three groups

as follows: group 1, all white infants; group 2, male Negro infants; and group 3, female Negro infants. The 1-year period of the study was then divided into 3 periods of 4 months each. The three prophylactic agents, 1 percent silver nitrate solution, 30 percent sodium sulfacetimide solution, and 10 percent sodium sulfacetimide ointment were used in rotation so that each group received each prophylactic agent for a period of 4 months.

Each infant received its respective prophylaxis of the eyes before leaving the delivery room. When silver nitrate was used, one drop of a 1 percent solution from a wax ampule was instilled into each conjunctival sac and 3 minutes later the eyes were irrigated with isotonic saline. The 30 percent sodium sulfacetimide was used in a like manner but the eyes were not irrigated following its instillation. In the case of 10 percent sodium sulfacetimide ointment, a 1/2-inch "ribbon" was applied to each eye. The ointment was not wiped away, neither were the eyes irrigated.

In the group of 1,907 infants, 682 received 1 percent silver nitrate, and of these 37 or 5.4 percent developed reactions. The average time of onset of the reactions in this group was 2.1 days. These reactions were characterized by a mild to profuse purulent discharge from one or both eyes with red, edematous lids in many cases. A few even developed vesicles on the lids and silver nitrate burns of the face were occasionally seen. These reactions usually persisted for 2 to 4 days and then cleared up with no sequelae. One infant in this group developed gonorrheal ophthalmia neonatorum on the first day of life.

The group of 642 infants that received 30 percent sodium sulfacetimide solution as prophylaxis developed 22 reactions or 3.4 percent, with an average time of onset of the reactions of 3.9 days. There were no cases of gonorrheal ophthalmia neonatorum in this group.

Of the 583 infants receiving 10 percent sodium sulfacetimide ointment, 26 or 4.5 percent developed reactions with an average time of onset of 3.3 days. The other case of gonorrheal ophthalmia neonatorum occurred in an infant in this group on the 3d day of life.

The reactions to both sodium sulfacetimide solution and ointment were not as severe and occurred later than those from silver nitrate. These reactions were manifested by a mild to moderate purulent discharge from one or both eyes with or without redness and edema of the lids, all of which cleared up in 2 to 4 days with no sequelae. No severe allergic reactions were noted.

From this study sodium sulfacetimide, especially the 30 percent solution, was found to produce less chemical conjunctivitis than 1 percent silver nitrate, and also seemed to be just as effective in preventing gonorrheal ophthalmia neonatorum, but further study is needed to confirm this latter point. (J. Pediat., December '50, J. E. Bickel)

Infected Pilonidal Cysts; A Simplified Method of Treatment: A method of treatment of infected pilonidal cysts is reported and the advantages over other methods of treatment are discussed. There were 22 patients reported: 12 had abscess formation, 6 had recurrence following previous surgical excision, and 4 had subacute painful infection with chronic drainage.

Technic. Treatment is done at the dispensary. The sacrococcygeal and buttock area is surgically prepared. The skin over the cyst, over the sinuses, and around the sinus openings is injected intradermally with 1 percent procaine hydrochloride and adrenalin. Each sinus is then carefully incised and followed to the point where it either coalesces with another sinus or enters the cyst sac. No incision is complete until the glistening band lining each sinus can be traced from the skin to the cyst sac. The incision in the skin is lengthened until it extends at least 5 mm. beyond the cephalad and caudal end of the cyst sac. Purulent contents are evacuated and gross gelatinous material and hair are wiped from the cyst sac. The sac is explored, noting particularly deep pockets or extensions. A surgical sponge moistened with sodium chloride is placed between the buttocks. Solid pieces of silver nitrate, each weighing approximately 0.2 to 0.3 Gm. each, are then implanted 1 or 2 mm. apart as deeply as possible in the gelatinous material and distributed 2 to 3 mm. apart in the pockets and extensions and in the cyst sac. Depending upon the size and configuration of the sac, this implantation and distribution will require from 1.5 to 4.0 Gm. of pieces of solid silver nitrate. As the silver nitrate dissolves, a black tarry mass is formed. After practically all the silver nitrate has dissolved (a period of from 20 to 30 minutes) a dry dressing is placed over the area and the patient detained in the ward for 4 hours. He is permitted to lie down, sit down, or be up and about as he chooses. It is at this point that the emotional make up of the patient determines whether he is to be admitted to the ward or returned to duty under treatment. After this 4 hour period a vaseline dressing is applied and the majority of patients are returned to duty with instructions to return each day for treatment until healing is complete. Daily treatment consists of hot sitz baths, inspection of the cavity and open packing with vaseline dressings. In 24 to 72 hours the cyst sac will become loose but the eschar on the skin may not loosen for 5 to 8 days. When the cyst sac is loose, it is gently grasped with forceps and dissected from the skin edge.

The action of the implanted and distributed silver nitrate is very limited. Its penetration appears to be limited to a depth of approximately 1 mm. In almost all cases it will not penetrate to a sufficient depth to destroy the thicker and projecting portions of the sac and small areas may remain. When, on the daily inspection, such is observed, 1 or 2 pieces of silver nitrate 0.1 to 0.2 Gm. each are implanted. As the cavity heals, the picture is that of a granulating wound. It is emphasized that close observation is necessary for abnormal tissue or suspicious tissue which must be removed by additional implantation.

In the 22 patients the total days of treatment were 559 days. Of these days, 543 were outpatient or duty under treatment days and only 16 were sick days of patients confined to the ward. Six patients were admitted for from 1 to 4 days with an average of 2.7 sick days. All incisions healed in a period of 16 to 37 days with an average of 25.4 days. The scars were not tender, were narrow, freely movable, and well cushioned. During a period of 8 months, no recurrence has been seen or reported. There were no complications or sequelae. Five patients complained of a burning sensation immediately following implantation of the silver nitrate and were given 1/4 gr. of morphine sulfate. One patient, although he had no pain, appeared apprehensive and reluctant to return to his regular work; 14 patients stated that they felt a stinging or warm sensation; and 3 patients experienced no unusual sensation of any kind. No medications or antibiotics other than procaine hydrochloride, silver nitrate, vaseline, or occasional sedation were used.

The author concludes that this method of treatment of infected pilonidal cysts possesses certain advantages over other methods in that (1) it requires no special surgical training to perform, (2) it prevents extension of the infection because definitive treatment is started as soon as the man presents himself, (3) the patient has practically no disability and usually performs his regular duties, (4) the healing time is markedly reduced, (5) the sick days are negligible. (Mil. Surgeon, January '51, Captain J. H. Korb, MC, USN)

Note: The author received the second prize for this article in essays submitted for the 1950 Sir Henry Wellcome Award and Medal.

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The Ligation of Major Arteries: Currently used methods for ligating major arteries are not without risk. These dangers are postoperative hemorrhage due to slipping of ligatures, erosion of the vessel wall by some constricting material, secondary hemorrhage due to infection, or the development of aneurysmal dilatation proximal or distal to the site of occlusion.

Perhaps the most successful, and certainly the most prevalent, technic for arterial ligation at this time is that used for small and medium-sized vessels and in certain instances for major arteries. This consists of division and ligation of the vessel between simple ligatures, suture ligatures, or a combination of the two. Practical experience and years of trial have proved this method to be adequate for both arteries and veins of moderate size. Reid's concept of using a ligature proportionate in size to the diameter of the artery, that is, the larger the artery the larger the ligature, is still in vogue today. However, when applied to an artery the caliber of the subclavian, iliac, or aorta, the dangers just enumerated are still present, and the margin of safety is not as great as one would desire.

In safely ligating the aorta factors other than the technic alone must be considered. The need for an adequate collateral circulation to the lower extremities, once the aorta has been interrupted, must be kept constantly in mind. However, it was not the purpose of the authors' work to devise a method for assuring an adequate collateral circulation. Rather they concerned themselves with the actual technic of carrying out the ligation of any major artery. The mechanical difficulties and failures involved in ligating the aorta can be applied in some degree to any large artery. Aortic ligation would seem to represent the maximum hazard for technical failure.

It is thought that the method of choice for interrupting the continuity of any major vessel is to employ a continuous suture of silk on an atraumatic needle to close both ends of the severed artery. This technic would eliminate the danger of slipping ligatures and also would have the advantage of being simple to perform. Encircling foreign materials are subject to erosion of the vessel wall by the lateral pulsation of the pressure pulse. A method avoiding such pressure erosion would theoretically be much safer. Instead of a large constricting ligature, a suture of small caliber at the end would seem to avoid this difficulty. In addition, this leaves less foreign body and should tend to minimize the chance of secondary infection.

The method is as follows: A long enough segment of the artery is dissected free to permit the application of some type of noncrushing arterial clamps between which the vessel can then be severed. In the authors' experimental work a pair of Gross aortic clamps has served admirably for this purpose. Once the artery has been divided, the ends are then sutured with 00000 silk on an atraumatic needle utilizing a through-and-through, over-and-over, continuous stitch across the open end and back again to create a so-called "baseball" stitch.

Modifications of this technic have been used before by others for specific types of arterial surgery. Gross reported the use of a continuous suture to close the ends of a divided patent ductus arteriosus. In operations for correction of coarctation of the aorta utilizing a subclavian-aortic anastomosis, Blalock and Park recommended closing the aortic end with a layer of mattress sutures reinforced by a continuous suture over the cut end. A technic similar to that of Gross was later used by Linton for the popliteal artery. In order to evaluate this method under the actual conditions to which such a suture line would be subjected, a series of experiments was carried out on dogs.

Of the 10 dogs surviving the operation, 9 were sacrificed at varying intervals or the site of ligation was observed during the course of subsequent operations in conjunction with other experiments. The remaining dog is living and well 4 months after operation. Since the dogs which died in the immediate postoperative period were all examined, observations of both short and long duration are on record.

In all cases the suture lines were intact and holding well. A fatality due to aortic rupture was not encountered. In the long-term observations healing was well advanced in all instances. The ends of the aorta were covered with peritoneum and scar tissue. At times it was difficult to identify the suture line without first dissecting this tissue away or actually opening the vessel. Despite the presence of the scar tissue, the ends were free to expand and pulsate in all directions without being impinged upon. In no case was there any evidence of beginning disruption of the suture line, erosion of the vessel wall, clot formation in the blind ends of the artery, aneurysmal dilatation of the vessel, or infection.

The authors believe the safest method for ligating any major artery is to divide the vessel between arterial clamps and suture the ends closed with atraumatic 00000 silk. This appears to eliminate, as far as is possible, the danger of hemorrhage from ligature failure or erosion. (Surgery, December '50, H. Swan and F. B. Harper)

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Escherichia Coli Endocarditis; Report of Case: Only 13 instances of proved bacterial endocarditis due to Escherichia coli have previously been clearly cited in the literature. Ordinarily, Escherichia coli does not enter the blood stream in sufficient quantity to produce septicemia even though it is a normal inhabitant in certain bodily sites. However, if disease lowers the resistance of the local tissue, the organism may pass into the blood in larger numbers, its portals of entry usually being the urinary tract, intestinal tract, female genital tract, or biliary system. Surgical operations in a region in which Escherichia coli is present can provide the mode of blood stream infection. Statistically, the groups most vulnerable are women from 20 to 40 years of age, men over 50, and newborn infants. This is due to the frequency of Escherichia coli endometritis in postpartum women and Escherichia coli urinary infections in men with prostatic obstruction, and to the lack of resistance in infants.

The outlook for the patient with Escherichia coli endocarditis is in sharp contrast to that of the patient who has Escherichia coli septicemia without endocarditis. In Felty and Keefer's series of 28 cases of septicemia, the mortality rate was 32 percent; these patients did not have the benefit of newer antibiotics. The mortality rate in reported cases of Escherichia coli endocarditis, on the other hand, has been 100 percent, even with the advent of newer antibiotics. The consistent fatality rate appears to be attributable to a persistent source for the infection of the blood stream. The fatality rate of 32 percent in the septicemia series of Felty and Keefer is explained by the fact that, in the cases of fatal disease, a focus of infection remained, such as a pelvic abscess, which could repeatedly feed organisms into the blood stream. Thus the determining factor for death in the two groups seems to be the same: localized persistent infection.

As opposed to the usual types of endocarditis, Escherichia coli invasion of the endocardium may occur in the absence of previous cardiac damage. In fact, in the majority of reported cases of Escherichia coli endocarditis, no significant antecedent disease of the heart could be found. The reason for such invasion remains an enigma; increased virulence of the particular strain of organism has been postulated.

The clinical onset of Escherichia coli endocarditis is usually sudden with chills, rigors, and fever. In some cases, however, the disease has begun insidiously. The duration of the disease in the reported cases has been 3 to 6 months with, as already mentioned, a consistently fatal outcome. Embolic phenomena in the kidneys, spleen, and brain have been common.

The valve most frequently affected has been the mitral, the aortic ranking second. Isolated infection of the tricuspid valve has been reported in 1 case. Combined involvement of the mitral and aortic valves has been reported in 1 case and combined mitral, aortic, and tricuspid involvement in 2. Involvement of the pulmonary valve has not been reported.

The authors' patient was a 69 year old white woman who was admitted to a hospital on 30 March 1950. Until January 1950 the patient had been well except for mild easily controlled diabetes of 3 years' duration. In January 1950, a cholecystectomy was performed from which she never quite recuperated. Three weeks prior to the last admission she experienced a severe chill followed by fever; until time of admission she had repeated bouts of chills, fever, nausea, vomiting and epigastric distress. She had grown increasingly weak and had lost about 30 pounds in weight. Physical examination revealed a dehydrated elderly woman appearing acutely ill: temperature was 101° F., pulse rate 100, respiration rate 20, blood pressure 160 over 60 mm. of mercury. There was a loud blowing systolic murmur over the precordium with maximal intensity at the apex. Minimal tenderness was present in the right upper quadrant. Various laboratory examinations were performed and a blood culture taken 30 March 1950 was positive for Escherichia coli.

On 1 April 1950 the oral administration of terramycin was started, 5 Gm. a day being given in divided doses. On 8 April, because of nausea and vomiting, the dosage was reduced, then discontinued for a few days, and then resumed in dosages of from 1 to 3 Gm. daily. The concentration of terramycin in the blood ranged from 0.5 to 8 μg. per cc. Because of an associated pyuria, a combination of sulfathiazole and sulfadiazine was given for a 3 day period. In spite of therapy, the disease progressed and the patient died on 5 May 1950.

A postmortem examination was done and among the pathologic features were: 300 cc. of clear amber fluid in the abdominal cavity, approximately 2 liters of similar fluid in each pleural cavity, and 200 cc. in the pericardial

cavity. On the free margin of the central part of the anterior cusp of the mitral valve there was a raised, rounded, friable mass 0.5 cm. in diameter extending to both surfaces of the cusp. The posterior mitral cusp and adjacent atrial endocardium of the left ventricle had numerous, small, raised, roughened areas. There was evidence of acute meningitis. Cultures obtained at necropsy from the left pleural fluid and basal meninges revealed Escherichia coli and a Micrococcus.

The fact that the blood stream of this patient had been repeatedly sterilized by terramycin therapy with the subsequent consistent reappearance of the organisms in the blood was evidence that persistent localized infection was present somewhere in the body with easy access to the blood stream. Necropsy revealed that the major site of such infection was the mitral valve.

The original entry of the Escherichia coli organisms may well have occurred at the time of the operation on the gallbladder. Such organisms frequently lurk in the diseased biliary tract and indeed, at times, in the normal biliary tract. Transient Escherichia coli bacteremia occurs frequently in the period immediately following cholecystectomy. In this case necropsy revealed that the site of the operation was well healed and not infected, probably owing to antibiotic therapy. Had the organisms been confined to the blood stream and had they not invaded the endocardium, this patient would probably have recovered.

The outlook for bacterial endocarditis due to Streptococcus viridans is fairly good with present-day methods of treatment. Such does not appear to be ture of Escherichia coli endocarditis, although enough patients have not been treated with the newer antibiotics (such as terramycin, aureomycin, and streptomycin) for one to be sure. The occurrence of nausea and vomiting was the limiting factor in this case in the maintenance of prolonged terramycin therapy, even though giving the tablets slowly with sips of cold milk helped allay some of the gastric irritation. Use of intravenous preparations of terramycin also is limited by local irritation with subsequent thrombosis of veins. Terramycin by rectum is not absorbed in measurable quantity and is ineffective. Combined therapy with two or more antibiotics might be tried, although whether or not it would alter the outcome of Escherichia coli endocarditis remains to be shown. (Proc. Staff Meet. Mayo Clinic, 3 January '51, M. S. Hoffman et al.)

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Cancer of the Cervix: The importance of improving the end results in the treatment of cancer of the cervix cannot be overemphasized. The National Office of the Bureau of Vital Statistics reported that between 1942 and 1944 malignant disease of this organ was responsible for 19.3 percent of all deaths from cancer in women. Only patients with malignant disease of the breast had a higher death rate. It has been estimated that the probability of the development of cancer of the uterus, that is of either cervix or endometrium, between birth and

death is 3.5 percent, and of the cervix alone, 2.1 percent. At the present time the 5 year survival rate following the treatment of this disease is less than 30 percent.

The majority of patients come to treatment in an advanced stage of their disease, whereas those patients fortunate enough to be submitted to treatment at an early stage have a relatively good prognosis. Increasing emphasis is being made, therefore, to bring patients with malignant disease of the cervix to the physician for treatment earlier than has been the case in the past.

In an attempt to accomplish this the authors recently used the Papanicolaou smear technic in 1,000 cases as an additional aid in the diagnosis of cancer of the cervix. The vaginal smears were obtained usually from the apex of the vagina, occasionally from the endocervix. They were not taken routinely but were taken in the majority of cases in patients showing some local cervical pathologic change or with a definitely abnormal menstrual history.

Of the 1,000 patients studied, 868 were considered to have negative Papanicolaou smears. Simultaneous biopsies of the cervix of 145 of this group revealed 2 cases of adenocarcinoma. On this basis a false negative report of 0.2 percent of the patients is reported. Of the 105 patients with questionable smears, 10 have been found to have cancer; 62 are considered free of the disease, and the remainder are being carefully followed.

Of the 27 patients with positive smears, 17 have been proved to have cervical carcinoma, 6 have been studied with no tumor found to date, and 4 so far have not been followed. Although 6 of these patients at present must be considered to have false positive smears, sufficient time has not elapsed to be certain that they do not have malignant disease.

During the same period of time in which these tests were made, 22 additional cases of cancer of the cervix were found by biopsy of fairly obvious lesions alone, no Papanicolaou smears having been taken. Of the lesions found, 6 were of the noninvasive or carcinoma in situ type, 17 were early epidermoid carcinomas, that is, Grade I, Stage I lesions, and 6 were early adenocarcinomas.

The number of patients with early malignant disease of the cervix brought to treatment during this period of time was greatly increased over any similar period in the authors' experience. How much credit can be given the use of the Papanicolaou smear technic is uncertain, however. The use of the smear has increased interest in this subject, more careful histories and pelvic examinations are being performed, and an increased number and more adequate cervical biopsies are being done. It is the authors' impression that the improvement in their early diagnosis of carcinoma of the cervix is a result of all these factors and not entirely due to the use of the Papanicolaou smear.

Certain facts concerning the early pathology of cancer of the cervix should be emphasized. Many malignant lesions of this organ begin as small areas of anaplastic cells without showing definite invasive qualities. These intra-epithelial lesions, noninvasive or cancer in situ, may be dormant for a considerable period of time before actual invasion and clinical cancer are apparent. It is in this group of cases that the use of the Papanicolaou smear has been of the greatest value. The smear does not, at the present time, replace cervical biopsy and treatment should rarely, if ever, be instituted without the positive histologic findings of cancer.

As a result of this recent experience, the policies listed below are being followed at the Lahey Clinic at the present time.

1. In taking the histories of all female patients in the childbearing age and in the postmenopausal group, particular attention must be given pelvic symptomatology. Over 80 percent of all patients with carcinoma of the cervix will be found to have a complaint of bleeding. Low back and pelvic pain and an abnormal vaginal discharge are next in significance. The higher incidence of malignant disease of the cervix in those patients who have borne children or who have had syphilis or previous pelvic surgery, particularly supravaginal hysterectomy, has been emphasized.

The bleeding associated with cervical malignancy has usually been spotting between the menstrual periods or following the cessation of periods rather than a simple increase in the amount of menstrual flow. Postcoital bleeding is of particular significance.

2. Careful pelvic examinations should be made on all female patients as a part of a general physical examination. The inspection and palpation of the cervix are of the utmost importance, and careful and adequate biopsies should be taken of all suspicious lesions.

Ninety-five percent of all cervical cancers are epidermoid lesions beginning usually at the margin of the external os. The lesion is usually an indurated granular area, bleeding easily on palpation. Adequate biopsy specimens must be taken from these areas. For the occasional adenocarcinoma found, usually curettement is necessary for the diagnosis.

3. Consideration must be given to the recognition and treatment of possible precancerous lesions of the cervix. Although the exact relation of lacerations of the cervix, erosions and cervicitis to cancer of this organ has never been adequately established, it is difficult to overlook reports that have appeared in the literature emphasizing the remarkably few cases of cancer discovered in patients who have had treatment of cervical infections and lacerations as compared with those who have cervical lesions which have remained untreated over a period of years.

All such conditions are viewed with suspicion, adequate biopsy specimens are taken from such lesions, and they are treated as indicated after the possibility of malignant disease has been eliminated.

4. It is believed that the use of the Papanicolaou smear technic in selected cases will increase the number of patients with early carcinoma of the cervix who come to the physician for treatment at a favorable time.

The Papanicolaou smear is of particular value in the follow-up study of all patients who have had previous surgical or radiation treatment for malignant disease in the pelvis, in cases of suspected precancerous lesions of the cervix, and in certain patients who have a history suggestive of pelvic malignancy but with normal pelvic findings. It is also justifiable to make the Papanicolaou test in many patients who are familiar with its significance because of the publicity which it has been given in the lay literature and who have a cancer phobia.

It must be emphasized, however, that as in any laboratory test, the accuracy of the results of the Papanicolaou smear method will be no greater than the reliability and experience of the technician making these reports. (Lahey Clin. Bull., January '51, N. W. Swinton)

Note: After considerable experience with the cytological technic in the recognition of uterine carcinoma, Reagan and Schmidt report that the ultimate accuracy of the procedure depends only in part on the experience of the microscopist. Of equal importance is the nature of the specimen submitted, the care with which it is taken and the method of preparing the tissue spreads. The term "spreads" implies an even distribution of the secretion rather than a daub or smudge and, in their opinion, is preferable to the word "smear." ("Evaluation of Cytological Technic in Recognition of Malignant Uterine Neoplasms," J.A.M.A., 11 January '51, J. W. Reagan and R. T. Schmidt)

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The Internist's Number One Problem--Chronic Disease in an Aging Population: In the minds of most internists, physical medicine and rehabilitation is a medical specialty which is primarily applicable to the specialties of orthopedics, surgery and neurology, but which lacks a close relationship to internal medicine. Until the last few years this concept was somewhat justified, for physical medicine was largely concerned with the passive application of light, heat, water and massage, and, although widely used in the treatment of peripheral vascular diseases, arthritis and other disorders of particular interest to internists, the greater emphasis was placed upon orthopedic and neurologic conditions.

During the past few years, however, there has developed a new concept of physical medicine and rehabilitation in which emphasis is placed not only on

reducing the physical disability of the patient, but upon retraining the permanently disabled patient to live and to work as effectively as possible with those remaining physical capacities which he possesses.

The development of this new concept of dynamic therapeutics through rehabilitation had its genesis in the wartime programs for disabled servicemen. The need is now accentuated by the growing incidence of chronic disease resulting from an aging population. Lacking specifics to cure many of the chronic diseases, medicine must look to rehabilitation to teach the chronically disabled to live within the limits of their disabilities but to the hilt of their capabilities.

It is in the area of chronic disease that physical medicine and rehabilitation holds great implications for internal medicine, for probably three-quarters of the time of the average internist is spent on patients with chronic illness. The problems of acute, communicable disease that commanded our major attention a few decades ago have been replaced by the problems of chronic illness. Ironically, it was the outstanding achievements of medicine during the past three decades that created our present problems: what to do with chronic disease and disability in our aging population.

Two thousand years ago, the average length of life was 25 years; at the turn of the century it was 49; today it is nearly 67. In 1900, one person in 25 was 65 years of age or older; it is estimated that in 1980 the ratio will be one in 10. The chances today are two out of three that a young man now starting his working life at the age of 18 will live to his retirement age of 65, and the chances for a 55 year old man are 78 in 100.

There are a number of problems in the field of rehabilitation which are of particular interest to the internist. Among these are hemiplegia; paraplegia; the etiology and management of ducubiti; the arthritic, the tuberculous, the cardiac, and the neurologic patient.

To attack the problem adequately, there must be interest and understanding. The patients ordinarily seen in a rehabilitation program are the "crocks." These are the patients in the back beds of the wards and the back bedrooms of their homes. They are not particularly interesting from a teaching standpoint and there are "too many of them." Then, too, the doctor has a rather frustrating experience in seeing them day after day without any definite planned program to offer.

Rehabilitation should offer a "service" to the medical specialist, a service that should aid in the solution of our number one problem, chronic disease and disability in an aging population. (Ann. Int. Med., December '50, H. A. Rusk)

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C-M Medium: A Mounting Medium for Small Insects, Mites, and Other Whole Mounts: Past experience in mounting mites has shown that the existing media are not completely adequate in many respects. A mounting medium was therefore sought that would permit ease and speed in mounting and yet have a refractive index that would give better definition of the morphological and gross histological structures. Experimentation was carried out using methocellulose, and the following formula was evolved:

Methocellulose	5 Gm.
Carbowax 4,000	2 Gm.
Diethylene glycol	1 ml
95% Ethyl alcohol	25 ml
Lactic acid	100 ml
Distilled water	75 ml

The methocellulose and alcohol are mixed, added to the remainder of the formula, and filtered through glass wool. The medium is then placed in an oven at 40° - 45° C. for 3-5 days, or until it has reached the desired consistency. If it becomes too thick the viscosity may be reduced by warming gently or by thinning with 95 percent ethyl alcohol or water.

Specimens cannot be transferred directly from glycerine, strong acids, or bases such as KOH clearing solution. It was found, however, that specimens cleared in KOH could be mounted safely if they were first rinsed in acid-alcohol.

Acarina, larval cestodes, nematodes, and insects (larvae and adults) have been mounted with excellent results. The best procedure for mounting mites was to clear thoroughly in lactophenol before mounting. At times a slight shrinkage occurs, but this can be reflected by warming the lactophenol solution and the mites slightly. Mosquito larvae mounted well by passing through cellusolve into the medium. Some of the more delicate specimens needed no special clearing procedure but were placed directly into the medium, thereby allowing the lactic acid in the medium to clear the specimen.

Some of the favorable characteristics of the C-M medium are as follows:

1. It has an excellent refractive index, 1.428, for arthropod tissues.
2. It is not visibly affected by light (does not turn yellow as does balsam).
3. It is heat-stable at average temperatures (slides were held at 55° C. for 6 months without visible change).
4. It acts as a temporary ringing compound. (Although it does not replace standard ringing compounds, it forms a temporary protection for the specimen.)
5. Specimens may be mounted from xylene, toluene, water, alcohol, cellusolve, lactic acid, lactophenol, or a number of other preservatives and clearing agents, or specimens may be placed in the mounting medium alive.

6. It does not crystallize (there were no signs of crystallization after slides were held at 55° C. for 6 months). Science, 29 December '50, E. W. Clark and F. Morishita)

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Appointments to Lieutenant (jg), MC, USN: The Chief of Naval Personnel has approved a recommendation of the Bureau of Medicine and Surgery whereby, effective immediately, all appointments to the grade of Lieutenant (junior grade) in the Medical Corps of the Regular Navy will be made by authority of Title II, Public Law 365, 80th Congress, instead of under the provisions of Section 23, Title 34, US Code. Under this revised policy the professional qualifications of all applicants for appointment in the Medical Corps of the Regular Navy will hereafter be determined by a Board of Medical Officers convened by the Surgeon General, on the basis of records and substantiating data submitted in the application files. Written, oral, or practical professional examination will not be required unless deemed necessary by the Board of Medical Officers.

While this particular change in policy is applicable only to appointments in the grade of LTJG in the Medical Corps of the Regular Navy, it has the effect of standardizing the procedure for determining professional qualifications for appointment and establishes a single appointment authority. Appointments in grades above LTJG have heretofore been made by authority of Title II, Public Law 365, 80th Congress. Hereafter any eligible Naval Reserve personnel and eligible civilians may apply for appointment under the above mentioned authority. The grade in which appointed is based upon age and professional experience.

All applicants are requred to have completed an accredited internship prior to appointment. Those serving in internship may submit their applications within 2 months of completion date, but appointments will not be issued until they have satisfactorily completed internship. All applicants must be physically qualified by the standards set forth in the Manual of the Medical Department for the Staff Corps, U. S. Navy.

Applications are invited from all categories of eligible personnel. The procedures applicable to each category areas follows:

Eligible civilians with no present service affiliation and Naval Reserve Medical Officers on inactive duty should apply at the nearest Office of Naval Officer Procurement.

Naval Reserve medical officers on active duty may submit application in letter form to the Chief of Naval Personnel via the Commanding Officer.

All applications should make reference to Title II, Public Law 365, 80th Congress and should state that application for appointment is being made under that authority. The application should be accompanied by:

(a) Application for appointment - NavPers 953A.

(b) A special fitness report covering the period from the date of the last report, or date of reporting for active duty, to the date of the application.

(c) Report of medical examination (Standard Form 88), 2 copies, with report of Medical History (Standard Form 89) attached to the original. Physical examination must be by a Board of Medical Examiners.

It is desired that the above information be brought to the attention of all medical officers of the Navy and Naval Reserve, eligible civilian physicians, medical schools, and local civilian medical societies. Eligible personnel should be encouraged to submit their applications at the earliest practicable date. (Assistant Chief for Personnel and Professional Operations, BuMed)

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Admiral Pugh Surgeon General: On 29 January 1951 Rear Admiral H. L. Pugh, MC, USN, in a ceremony in the office of the Secretary of the Navy, took the oath of office as Surgeon General of the United States Navy and Chief of the Bureau of Medicine and Surgery. Admiral Pugh succeeds Rear Admiral C. A. Swanson, MC, USN.

On the same date, Rear Admiral C. J. Brown, MC, USN, succeeded Admiral Pugh as Deputy and Assistant Chief of Bureau.

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From the Note Book

1. Lieutenant Peter E. Arioli, MC, USNR, of 2928 Derby Street, Berkeley, California, was the first Navy medical officer to lose his life in Korea. He was killed by sniper fire on 3 December 1950 while serving with the First Marine Division. To date, 263 hospital corpsmen have been casualties in Korea; of these 37 have been killed and 10 are listed as missing in action. Three medical officers have been wounded. (PIO, BuMed, 18 January '51)

2. The first 100 Navy medical officers now on loan to the Army have been issued orders to return to duty with the Navy; 470 remaining officers will be ordered back in monthly increments. (PIO, Dept. of Defense, 11 January '51)

3. BuPers C/L 196-50 of 15 December 1950 sets forth administrative procedures for the inter-service transfer of officers of the Medical, Dental, Nurse, and Medical Service Corps of the Regular Navy and Naval Reserve, exclusive of retired officers and Hospital Corps officers. Applications may be submitted for transfer to Army or Air Force. (PIO, BuMed, 15 January '51)

4. Most of the estimated 3 million lepers in the world are in China, India, and Africa. The United States is believed to have between 500 and 5,000 unclassified and undiagnosed leprosy patients. (Science News Letter, 16 December '50)

5. A fatal case of aplastic anemia following the prolonged administration of chloramphenicol (chloromycetin) is reported. As nearly as the authors can determine, this is the first report of such a reaction occurring during the use of the antibiotic. (Ann. Int. Med., December '50, M. L. Rich et al.)

6. A documentary color film, "The Embryology of of Human Behavior," has been completed under ONR contract by the Medical Film Institute. Narrated by Dr. Arnold Gesell, whose 20 years of work in child growth and development it documents, the film is largely concerned with the motor skills of children. It will be used by the Navy in the training of psychiatrists, and is expected to be distributed by BuMed to certain Navy installations. (BioSciences, ONR)

7. A severe epidemic of wheat stem rust is menacing the whole wheat crop of this year. The seriousness of the new rust invasion lies in the fact that it affects all kinds of bread and macaroni wheats, used for cakes, crackers, and other breadstuffs. The U. S. Department of Agriculture and the State agricultural experiment stations are alerted to the danger and the fight is underway, although so far funds available for defense are inadequate. (Sci. News Letter, 6 Jan '51)

8. A synthetic narcotic, methadone hydrochloride, replacing morphine, is now being used in the field by the Army. The drug has the same pain relief effect of morphine, is much easier to obtain, and frees the United States of its

dependence on opium markets in Asia and the Near East. The preparation is composed of nitriles derived from nitrogen and hydrocarbons. (Washington News, J.A.M.A., 20 January '51)

9. Thirty-one young medical officers are now attending the Basic Course in Naval Medicine for Officers of the Medical Corps at the U. S. Naval Medical School, NNMC, Bethesda, Maryland. (PIO, BuMed, 19 January '51)

10. Funds have been allocated jointly by the Army, Navy, and Air Force for the study of artificial respiration technics for victims of nerve gas poisoning. In such cases the victim's muscles become temporarily paralyzed, and the Schaefer method, which depends on relaxation of the respiratory muscles during inhalation, would not be efficient. (Bio Sciences Group, ONR. See Medical News Letter, Vol. 16, No. 9)

11. The Boston Medical and Surgical Journal of 25 December 1850 reported that, "Our moustached friends will be glad to learn that the London National and Military Gazette has made the discovery that the wearing of moustaches is conducive to health. It affirms that the moustaches, acting as a part of the breathing apparatus, absorb the cold of the air before it enters the nostrils, and are, consequently, a preservation against consumption." (New England J. Med., 28 December '50)

12. The Gonzales Warm Springs Foundation Hospital located near Gonzales, Texas, has recently been certified as a physical medicine and rehabilitation hospital by the American College of Surgeons, the first of its kind to be so listed. (Arch. Physical Med., December '50)

13. Synthetic vitamin C given orally in large daily doses, 500 mg. to adults, 100 mg. to small infants, relieved the itching and paresthesias and cleared the rash of prickly heat in patients on humid, hot tropical islands, and in a dry, hot desert area. (Correspondence, J.A.M.A., 20 January '51, R. L. Stern)

14. The Bureau of Medicine and Surgery exhibit at the annual meeting of the American Academy of Orthopedic Surgeons in Chicago from 27 January to 1 February featured the results of studies of various types of bone graft technics. (Washington News, J.A.M.A., 20 January '51)

15. About 40 percent of the land area of the United States receives too little rainfall for safe general agriculture. (Science News Letter, 16 December '50)

16. The physiological reaction to pituitary adrenocorticotropic hormone (ACTH) in severe burns appears in the J.A.M.A., 13 January 1951, M. J. Whitelaw.

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Influenza News: The World Health Organization Weekly Epidemiological Record for 17 January 1951 reports high incidence of influenza in several countries including Japan, Greenland, Spain; declining incidence in Denmark, Norway and Sweden; invasion of France beginning. Attack rates were very high but the disease was mild, not exceeding duration of 3 to 5 days. Deaths were practically nil in Scandinavia.

To date the U. S. Navy has had one significant outbreak. A cruiser put in at Barcelona, Spain, January 9 to 13. By the 18th, 80 cases had occurred; by the 21st, 316; only 5 cases per day were admitted on the next 3 days. Only 107 of the total of 431 cases were admitted to the sick list. This indicates an explosive type of outbreak, involving about 30 percent of the crew, but quite mild in character.

A strain of influenza virus recently isolated from London cases in January has been sent to the United States for study. It is found to be an A-prime, apparently identical with the A-primes recovered earlier in Sweden and Holland. An A-prime virus has also been implicated in Spain and Ireland. The English strain is more closely related to the Cuppet A-prime virus isolated in 1950 and incorporated into the 1950 Army vaccines; less closely related to the FM-1 strain, which is the sole A-prime strain in 1948 and 1949 vaccines. Protective power of the 1950 vaccine against this strain will have to be determined. Only very limited stocks of vaccine are available, its value is undetermined, and the disease has been generally so mild that vaccination is not considered feasible or necessary on a wide scale.

It is to be remembered that vaccines are made of influenza viruses, usually of 3 (or 4) strains, grown in fertile eggs, concentrated, and killed. Persons strongly sensitive to eggs cannot receive it; fatalities have resulted from egg-containing vaccines. Modern vaccines are mixtures of one Type A, one Type B, and one (or two) A-primes (FM-1, Cuppet). If it is desired, vaccines can be composed of single types. At least one month is required to manufacture vaccine from receipt of a new strain, longer if large amounts are required.

At a meeting of the Influenza Study Program at the National Institutes of Health on 18 January 1951, in which many United States experts participated, the following opinions were expressed:

1. Localized epidemics of influenza occur at this season in the United States every year. Only occasionally do these localized epidemics become widespread. None have had the characteristics of the 1918 pandemic of influenza.
2. The extensive epidemic now existing in England is relatively mild and does not have the characteristics of the 1918 pandemic. At this time there is no reason to believe that the present epidemic in England necessarily indicates that there will be a serious or widespread epidemic in the United States this year.

3. The question of immunization against this outbreak or any outbreak of influenza is not settled. There is no vaccine that can be expected to protect with certainty. However, this situation indicates the necessity for continuing controlled studies of the efficacy of influenza vaccines in man.

4. It is expected that some influenza will appear in the United States, but that the disease will be similar to our recent experiences with influenza. Since the greatest part of the mortality results from bacterial complications in the respiratory tract, it is recommended that for patients who have a severe influenza-like illness, appropriate antibiotics be used. (Preventive Med. Div., BuMed)

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Phosphatase Test Warning: Veterinary laboratory personnel are reminded that the tablets (Stock No. 4-355-400) used in conducting the phosphatase test will deteriorate in storage. These tablets have, therefore, been removed as a component of the Milk Testing Kit, Pasteurization Scharer (4-355-200). The life expectancy of the tablets is approximately 1 year. Future procurement of tablets is to be limited to a 6-month's supply in order to insure a fresh stock. Personnel using them are cautioned to verify the expiration date of the tablets prior to use. If question as to potency arises, check tests may be run on known pasteurized, underpasteurized, and raw milk samples. Difficulty encountered with phosphatase test results in the past has been due, in many cases, to the use of deteriorated tablets. (Preventive Med. Div., BuMed)

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List of Recent Reports Issued by Naval Medical Research Activities:

Naval Medical Research Institute, NNMC, Bethesda, Maryland.

The Reaction Between Actomyosin and Various Nucleotides and Phosphates, as Followed by Ultraviolet Absorption, NM 000 018.04.02, 23 June 1950.

Medical Research Laboratory, U. S. Naval Submarine Base, New London, Conn.

The Effects of Sound Intensity Level on Judgments of "Tonal Range" and "Volume Level": An Interpretation of the Loudness Function, MRL No. 163, NM 003 041.20.5, 4 December 1950.

Graphs for Determining the Significance of the Difference in Proportions (And for Determining Sample Size When Proportion Values are Estimated), MRL No. 161, NM 003 041.42.01, 5 December 1950.

Studies in Short Duration Auditory Fatigue (Parts II and III), MRL No. 168, NM 003 041.34.02, 8 December 1950

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BUMED CIRCULAR LETTER 51-8 11 January 1951

From: Chief, Bureau of Medicine and Surgery
To: Hospitals, Hospital Ships, and Ships and Stations Having Accommodations for In-Patients

Subj: Clinical Record Series, Standard Forms 501 through 539; use of

Ref: (a) BuMed Cir Ltr No. 49-155 of 23 Nov 1949
(b) Par. 515.3(a) ManMedDept

Encl: (1) Instructions pertaining to use of subject forms
(2) Set of subject forms

1. Reference (a) is canceled and superseded.

2. Enclosure (2) is forwarded for information and reference when submitting requisitions to district publications and printing offices.

3. Subject forms shall be placed in effect as soon as practicable and shall replace similar or related forms currently in use.

4. Instructions pertaining to the use of certain of the subject forms are appended as enclosure (1).

-C. A. Swanson

The above letter will not be printed in the Navy Department Bulletin.

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JOINT LETTER

BUMED CIRCULAR LETTER 51-9 12 January 1951
BUPERS C123a-swb

From: Chief, Bureau of Medicine and Surgery
Chief of Naval Personnel
To: All Ships and Stations

Subj: Radium plaque adaptometer night-vision testing of naval personnel; discontinuance of

Ref: (a) Joint letter; BuMed-536-NLB:EM, P2-5/P3-1, BuMed Cir Ltr 47-115; Pers-423a, P11-1; of 29 Aug 1947; Dec 1948 NDB, 47-815, p. 608
(b) BuMed Cir Ltr 47-137

1. Reference (a), which directed that all naval personnel, including both officer and enlisted, newly entering the service be tested for night vision by the radium plaque adaptometer, is hereby canceled. Reference (b), which modified the 1944 revision of the Catalog of Hospital Corps Schools and Courses to include a course of instruction in night vision testing by the radium plaque adaptometer, is also canceled.

2. While the program for the night-vision testing by the radium plaque adaptometer of all personnel newly entering the service is being discontinued, it remains important that night-vision training be utilized to its fullest extent for the indoctrination and maintenance of night-vision acuity in all naval personnel.

BUMED: C. A. Swanson BUPERS: J. W. Roper

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BUMED CIRCULAR LETTER 51-10 15 January 1951

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Funeral Flags

Ref: (a) MIL-F-1593 31 Oct 1949 Military Specification, Flags, National Ensign, U. S. Interment
(b) Paragraph 3456.1, Manual of the Medical Department

1. Reference (a) has been approved by the Departments of the Navy, Army and Air Force, and, accordingly, U. S. National Ensign #8, cotton, will replace U. S. National Ensign #7 as an interment flag for the Armed Forces. The performance type budget now in effect places responsibility for funeral flags under the Bureau of Medicine and Surgery beginning with the fiscal year 1951. It is therefore directed that all naval activities authorized to issue funeral flags request their supply departments to carry their requirements of National Ensign #8 in stock. At activities where flags are not carried by the supply department, they may be obtained, as required, from the Veterans Administration by application to local post offices. In instances where flags are procured in this manner, application for replacement will be made to the Bureau by the Veterans Administration.

-C. A. Swanson

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BUMED CIRCULAR LETTER 51-11 16 January 1951

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Disinsectization of naval vessels and aircraft

Ref: (a) BuMed Circ. Ltr. No. 45-224
(b) BuMed Circ. Ltr. No. 48-36
(c) BuMed Circ. Ltr. No. 49-87; NDB Jul-Dec 1949, 49-494, p. 110
(d) BuMed Circ. Ltr. No. 49-146
(e) BuMed Circ. Ltr. No. 50-4; NDB 15 Jan 1950, 50-20
(f) General Order No. 20 of 22 May 1950, Quarantine Regulations for Vessels and Aircraft of the Armed Forces
(g) FSA, PHS ltr to Air Line Medical Directors and Others Concerned of 28 Mar 1949
(h) Navy Department Specification 51-I-5 of 15 Feb 1949
(i) Manual of Medical Department, Chapter 22, Section X, Quarantine Procedures

1. References (a), (b), (c), (d) and (e) are canceled and superseded by this letter.

2. Vessels.--Before arriving in port the medical officer (or senior representative of the medical department) aboard a naval vessel shall make an inspection to determine whether insects capable of transmitting disease exist aboard. In the event disease vectors are discovered, suitable disinsectization procedures shall be recommended to the commanding officer. Such procedures include treatment of spaces with aerosol insecticide at the rate indicated on label of container. Spaces should be closed and ventilators secured during treatment. Collections of water in small boats on deck and in similar situations should be treated when such situations present evidence of breeding of mosquitoes or other disease vectors. Disinsectization in these situations ordinarily will be accomplished by eliminating the breeding source, or in certain instances by spraying the surfaces with standard Navy insecticide (liquid) or with liquid 5% DDT preparations.

3. Aircraft.--Where disinsectization of aircraft is required by the naval district commandant, area commander, or senior naval officer in command of an embarkation area pursuant to Section III, Part V, paragraph 1 (a) of reference (f), disinsectization must be accomplished immediately before take-off by treatment with aerosol insecticide, Navy specification, (reference (h)), at the rate of 6 seconds spraying per 1,000 cubic feet of space or with a formulation and dosage approved for this purpose by the USPHS, (reference (g)), or by approved automatic disinsectization equipment. Spraying with aerosol insecticide should be accomplished with all hatches and doors secured. After disinsectization, hatches and doors should not be opened before take-off.

4. Disinsectization should always be accomplished on leaving ports where yellow fever is known to exist. Similarly, special attention should be directed to disinsectization of vessels and aircraft proceeding from areas where malaria

mosquitoes exist to areas where these insects do not exist. Particular cognizance should be taken of cargo loaded from plague-infected ports.

5. Until such time as a new uniform aerosol specification approved by all governmental agencies concerned is available, the present Navy specification(reference (h)) may be used. This formula contains DDT and pyrethrins and is listed as Standard Stock Item No. 51-G-120-31 - 1 pound cylinder and 51-G-120-44 - 44 pound cylinder for recharging portable containers. Refilled bombs will contain this DDT-aerosol mixture and will be marked accordingly.

6. In the event that aerosol insecticides that meet the specifications of reference (h) are not available, refilled bombs may be procured at the nearest refilling facility, locations of which are as follows:

(1) New York Naval Shipyard, Brooklyn 1, New York
(2) Boston Naval Shipyard, Boston 29, Massachusetts
(3) Norfolk Naval Shipyard, Portsmouth, Virginia
(4) Marine Corps Air Station, Cherry Point, North Carolina
(5) Charleston Naval Shipyard, Naval Base, South Carolina
(6) U. S. Naval Supply Depot, Great Lakes, Illinois
(7) Puget Sound Naval Shipyard, Bremerton, Washington
(8) San Francisco Naval Shipyard, San Francisco 24, California
(9) U. S. Naval Supply Center, Oakland, California
(10) U. S. Naval Supply Depot, San Diego 31, California
(11) U. S. Naval Supply Depot, Guam, Marianas Islands

7. In the event question arises as to whether disinsectization has been successfully acomplished, or where any special problem of insect infestation exists not amenable to disinsectization procedures herein recommended, request for assistance should be made by the vessel or aircraft commander to quarantine officials at the seaport or airport upon arrival.

8. This circular letter supplements instructions at present found in references (f) and (i).

-H. L. Pugh
Acting

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BUMED CIRCULAR LETTER 51-12 17 January 1951

From: Chief, Bureau of Medicine and Surgery
To: Medical Officers, Continental Stations having Infirmaries

Subj: Report of Patients, NavMed-I

Ref: (a) Par 5111, ManMedDept
(b) BuMed Cir Ltr 50-35

1. Effective with the January 1951 report, addressees submitting NavMed-I on a monthly basis shall add the following information to the sheet attached to subject report.

	Total	Navy and Marine Corps	Army and Air Force	Other
Peak census	____	_____	_____	____
Average census	____	_____	_____	____

2. By "Peak census" is meant the maximum number of patients remaining any day during the period.

3. By "Average census" is meant the sum of the number of patients remaining each day of the period, divided by the number of days in the period.

-H. L. Pugh
Acting

The above letter will not be printed in the Navy Department Bulletin.

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BUMED CIRCULAR LETTER 51-13 22 January 1951

From: Chief, Bureau of Medicine and Surgery
To: All Ships and Stations

Subj: Physical examinations, members on temporary disability retired list, reporting of

Ref: (a) Public Law 351 - 81st Congress (Career Compensation Act of 1949)
(b) Enclosure (1) to BuMed C/L 50-22 of 3 March 1950

1. In accordance with Sections 402(e) and 404(a) of reference (a), members whose names have been placed upon the temporary disability retired list will be required to submit to periodic physical examinations during the period that their names are carried on such lists. Orders for such examinations will be issued by the Chief of Naval Personnel or the Commandant, U. S. Marine Corps, as appropriate. In conducting and reporting upon such examinations, medical examiners should bear in mind the fact that the examination is for the purpose of furnishing information upon

which a determination can be made as to whether the disability for which the member was placed on the temporary disability retired list has changed.

2. In view of the foregoing it is desired that subject examinations be conducted and reported upon in accordance with the provisions of reference (b). The provisions of paragraph 6(c) of reference (b) are particularly pertinent in this regard; but paragraphs 7 and 8 of reference (b) are not applicable. A board conducting such a periodic physical examination shall conduct or cause to be conducted such examination of the member concerned as is necessary to formulate a considered conclusion as to the individual's present state of health, with particular reference to the disability which caused his placement on the temporary disability retired list. When considered necessary the board may request that the Bureau of Medicine and Surgery furnish it the complete medical record of the individual under examination.

3. The report of the board shall be submitted in letter form to the Physical Review Council via the commanding officer of the examining authority. The subject shall include the member's full name, rank, grade or rate, file or service number and the phrase "Report of Periodic Physical Examination."

-C. A. Swanson

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BUMED CIRCULAR LETTER 51-14 22 January 1951

From: Chief, Bureau of Medicine and Surgery
To: AlNavStas and MarCorpsActivities Having Medical Officers Aboard, CLUSA

Subj: Medical Board reports, forwarding of copies of in certain cases

Ref: (a) Para. 3317.1, ManMedDept
(b) Joint Letter-BuPers-BuMed-MarCorps dated 24 February 1949 (BuMed Circular Letter No. 49-19)
(c) Joint Letter-BuPers-BuMed-MarCorps dated 21 April 1950 (BuMed Circular Letter No. 50-41a)
(d) BuMed Circular Letter No. 50-22

1. In all cases where members having served less than six months on their current tour of active duty are reported upon by a Clinical, Medical Survey, or Aptitude Board or a Board of Medical Examiners and the recommended disposition is such as would probably lead to separation from service by reason of unfitness, considered to have existed prior to reporting for active duty, a copy of the Board's report shall be forwarded by the convening authority, with a letter of transmittal, to the station which conducted the initial physical examination of the member reported upon, for entry into active service.

2. The foregoing is intended to provide examining stations with information pertaining to possible deficiencies in examining procedures in order that corrective action may be taken where indicated with a view to further insuring that unfit persons are not accepted for active duty.

-C. A. Swanson

The above letter will not be printed in the Navy Department Bulletin.

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JOINT LETTER

BUMED CIRCULAR LETTER 51-15 25 January 1951
BUPERS-B22-JMS

From: Chief, Bureau of Medicine and Surgery
Chief of Naval Personnel
To: All Ships and Stations

Subj: Information and Instructions Relative to Transfer of Enlisted Personnel to Naval Hospitals or Hospital Ships for Treatment, or to Receiving Ships or Receiving Stations Upon Completion of Hospitalization, Concerning Disciplinary Action Taken or Pending

Ref: (a) Joint BuPers-BuMed ltr (BuMed Cir Ltr 45-6); NDB Cum. Ed. 1948, 45-49, p.589
(b) Article C-7811, BuPers Manual

1. Reference (a), concerning subject, is hereby canceled in view of sufficient coverage by reference (b).

C. A. Swanson J. W. Roper

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JOINT LETTER

BUMED CIRCULAR LETTER 51-16 26 January 1951

From: Chief, Bureau of Medicine and Surgery
Commandant of the Marine Corps
Chief of Naval Personnel
To: Commanding Officers, All Naval Hospitals

Subj: Members of Fleet Reserve and Fleet Marine Corps Reserve; Physical fitness for duty in the cases of

Ref: (a) Regulations Prescribed by the Secretary of the Navy for the Administration of Title IV of the Career Compensation Act of 1949
(b) BuMed Circular Letter 50-22
(c) BuPers Manual, Article H-9410
(d) Marine Corps Manual, Paragraph 10409(2)

1. References (a) and (b) provide that cases be referred to Clinical Boards when there is reason to believe that the member should be considered for separation or retirement by reason of physical disability.

2. References (c) and (d) provide for classification of members of the Fleet Reserve or Fleet Marine Corps Reserve in respect to physical fitness for duty and at the present time only those members unfit for any duty are transferred to the retired list for physical disability.

3. For the purpose of determining if members of the Fleet Reserve and Fleet Marine Corps Reserve should be brought before a Clinical Board with the view to appearance before a Physical Evaluation Board, unfitness to perform the duties of the member's rank or rating shall be construed to mean unfitness to perform any duty.

4. In view of the foregoing, when members of the Fleet Reserve or Fleet Marine Corps Reserve who are in an active duty status are considered to be unfit for any further naval service, the case should be referred to a Clinical Board. If, however, such members present conditions which disqualify them for the performance of unrestricted duty but which do not disqualify them for the performance of restricted duty, a report of medical survey shall be submitted to the Chief of Naval Personnel or the Commandant of the Marine Corps, as appropriate, by way of the Bureau of Medicine and Surgery, in order to permit an administrative determination as to whether the member's services are desired subject to the restriction imposed by his physical defects.

5. The foregoing is intended to permit of the full utilization of the services of subject members as long as they can be usefully employed on active duty. When any such member can no longer be usefully employed in any capacity or if assignment to even restricted duty would be particularly likely to impair the health of such member and provided he otherwise qualifies therefor, he may be afforded the opportunity of having his case reported upon by a Clinical Board.

C. A. Swanson J. W. Roper C. B. Cates

The above letter will not be printed in the Navy Department Bulletin.

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BUMED CIRCULAR LETTER 51-17 26 January 1951

From: Chief, Bureau of Medicine and Surgery
To: All Naval Hospitals

Subj: Hospitalization and subsistence furnished Foreign Naval Personnel Trainees under the Mutual Defense Assistance Program

Ref: (a) BuSandA Ltr OF-62-C(EMC:cml), L11-7/EF of 16 June 50
(b) BuMed Cir Ltr No. 50-58
(c) BuMed Cir Ltr No. 51-4

1. Foreign naval personnel attached to naval hospitals for training under the Mutual Defense Assistance Program shall be reported on Line 100 of NavMed 36, Ration Record, classified as "Foreign Naval Personnel, MDAP Trainees". Collection for subsistence furnished officer personnel shall be made locally by the collection agent at the rate of $1.95 per ration. The number of these rations sold shall be included in Line 106, Columns III(c) and IV(c).

2. When hospitalized, MDAP Trainees shall be reported as "Foreign Military Personnel" on Line 66. The number of days applicable to each MDAP Trainee shall be reflected under "Remarks". Separate DD Form 7, Report of Treatment Furnished Pay Patients, Hospitalization Furnished, is required for each case hospitalized. Reimbursement for hospitalization furnished (including subsistence for enlisted personnel) will be effected by the Bureau. Collection shall be made locally for subsistence furnished hospitalized officer personnel at the rate prescribed for the value of the hospital ration.

3. A statement certifying the number of days subsisted during the period of hospitalization shall be furnished the Disbursing Officer paying the per diem allowance in each case. For officer personnel, this statement shall include notation to the effect that local collection has been,or will be, made. A copy of each certified statement shall be forwarded with the NavMed 36, Ration Record for the month.

4. It is requested that each naval hospital having MDAP Trainees attached submit a report in the following form to cover the period through 31 January 1951:

a. Name of Trainee
b. Country or Country Code
c. Invitational Travel Order Number
d. Date attached
e. Date detached (if applicable)
f. Dates of hospitalization
g. Total amount collected locally for subsistence furnished.

-C. A. Swanson

BuMed Circular Letter 51-17 will not be printed in the Navy Department Bulletin.

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BUMED CIRCULAR LETTER 51-18 26 January 1951

From: Chief, Bureau of Medicine and Surgery
To: All Hospitals and Hospital Ships

Subj: Completion and forwarding of 1950 NavMed-F reports

Ref: (a) Instructions Governing Individual Statistical Report of Patient (NavMed-F), NavMed-P-1313

1. To close out the data abstracted from the 1950 NavMed-F reports, it is essential that all reports relating to calendar year 1950 be completed and forwarded as quickly as possible after 1 February 1951.

2. So that it will be possible to ascertain when all reports have been received, a letter of notification shall be sent to the Bureau when the last of the subject reports have been forwarded.

-C. A. Swanson

The above letter will not be printed in the Navy Department Bulletin.

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